THESIS FOR M.D. DEGREE.

Edinburgh University.

" Occipito-posterior positions, with observations on five thousand cases "

By.

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The subject of occipito-posterior positions is to every-one practising obstetrics a most important and interesting field for observation and study. Fortunately, in the larger majority of cases normal rotation to an anterior position takes place. However, we meet with persistent posterior positions frequently enough to make the subject well worth our careful consideration and study. Unskillful management, whether it be due to inability on the part of the accoucheur to make a correct diagnosis, or to lack of skill in technique, may prove exceedingly disastrous either to mother or child, or both.

Whilst holding a resident appointment at Queen Charlotte's Hospital I examined the case-sheets of more than 20,000 patients and found that in 18,124 vertex presentations 5,000 were diagnosed as occipito-posterior positions.

We will consider two tables of analysis: firstly statistics dealing with out-patients, secondly statistics dealing with in-patients.

1. As regards out-patients who come up about the 30th. to the 32nd. week of pregnancy for pelvic measurements and abdominal palpation along with a general examination, I found that,

Of 4,393 vertex presentations there were 1,236 posterior positions, or over 28%, made up of,

R.O.P. 715 or 16.3% of vertex presentations.

L.O.P. 521 or 12.9% of vertex presentations.

Total occipito-posterior ~~presentations~~ positions 1,236 or 28.3% of total vertex presentations.

In a great number of cases we find the occiput lying in the transverse, either an R.O. transverse or an L.O. transverse, and there is much evidence to show that the position of the occiput frequently alters.

2. The statistics dealing with in-patients has been made as comprehensive as possible concerning Etiology, Diagnosis, Treatment and Prognosis.

The frequency with which this abnormal position occurs has not yet been fully appreciated; it is the most common abnormality the obstetrician has to deal with.

Out of 13,761 vertex presentations, 3,763 or more than 27.0%, were occipito-posterior positions.

The right occipito-posterior position has been generally stated to be much more common than the left occipito-posterior position. I have ascertained, however, that the left is much more common than is supposed.

2,094 were R.O.P. or 15.2% of the total vertex presentations.

1,669 were L.O.P. or 12.1% ,, ,, ,, ,,
3,763

1 was a P.(?) O.P.
3,764.

In this case a P.O.P. was noted to extend and become a Brow presentation.

Cases in which the occiput lies nearly in the sacral hollow

and descends thus must be exceedingly rare (1). Alhousen's book is the only one in which much mention is made and Trapl, in discussing a case under his care (2), says they are rarely diagnosed and only eleven are published all together.

The occiput was primarily anterior in one case, an R.O.A. in a primipara. This rotated back to the R.O.P. position which necessitated manual rotation to an anterior position and delivery with forceps. I cannot find much mention of such cases and take them to be exceedingly rare, although in Jellet's Manual of Midwifery, mention is made of the fact that they occur (3). In statistics of the Baudelocque Hospital, out of 8,007 patients, the posterior position of the occiput was noted in forty-four cases (I take it to mean persistent posterior positions), and in seventeen was the occiput primarily anterior (4). However, in this country I do not think they are quite so frequent.

In two cases primarily L.O.P. positions were delivered in the oblique, both in primiparae. One L.O.P. in a primipara became a brow, which necessitated manual rotation and forceps.

One L.O.P. in a primipara changed spontaneously into a Face and was born without interference.

Four R.O.P. primary positions extended and became Brow presentations; each necessitating manual rotation and forceps. In two of these cases the placenta was adherent and post-partum haemorrhage followed.

Of the 2,094 R.O.P's 66, or 1.7% of the total number of posterior positions, were born with the occiput posterior.

Of the 1,669 L.O.P's, 55, or 1.4% of the total number of posterior positions, were born with the occiput posterior.

Thus 122, or 3.2% of the total number of posterior positions, (i.e.3,764) were born with the occiput posterior.

Naegele found 1 in 73, or 1.37%. Clifton Edgar (5), out of 2,200 found 89 cases persisted, or slightly over 4%.

In 3,764 posterior positions rotation to an anterior position and normal delivery occurred in 2,676, or in 71% of the total number of posterior positions.

In 122 cases in which the occiput was born in the posterior position 99, or 81% were delivered without operative interference. In 23, or 19%, operative interference was necessary.

Little notice has yet been taken of the fact that occipito-posterior positions are much more common in primiparae than in multiparae.

Out of 3,764 occipito-posterior positions,

1,417 were multiparae,

2,347 were primiparae.

In multiparae 10.37% of the total vertex cases (13,761) were occipito-posteriors.

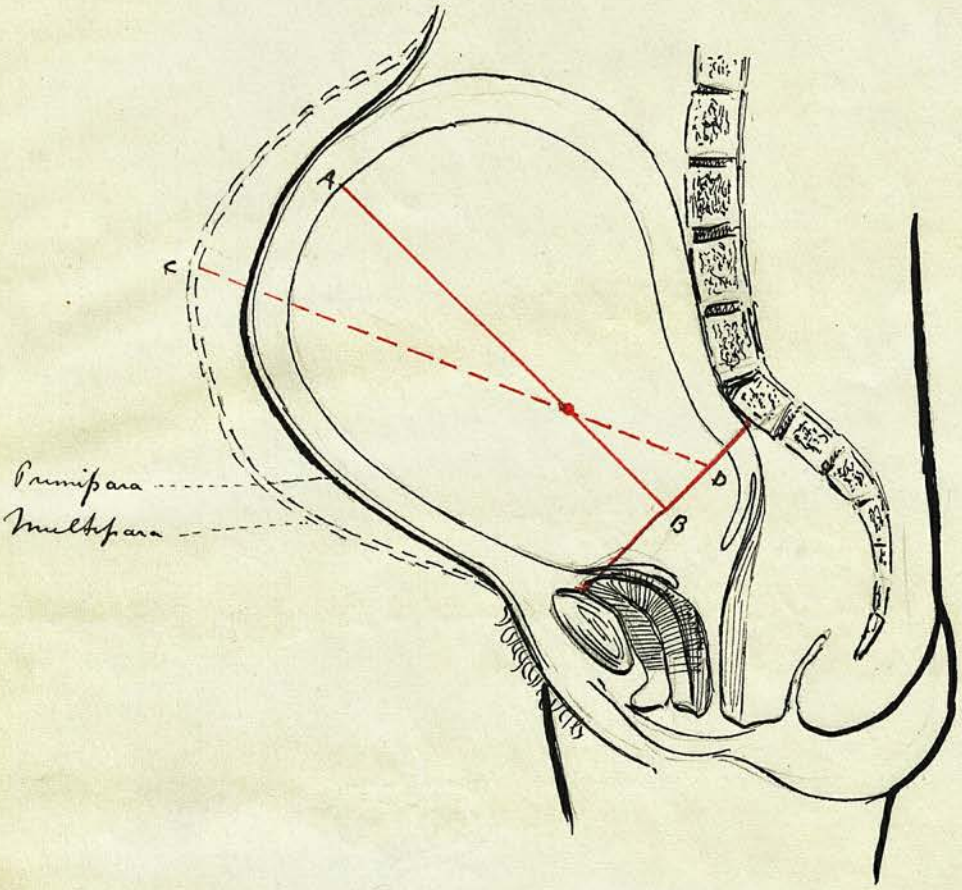
In primiparae 17.9% of the total vertex cases were occipito-posteriors.

Statistics taken from general practice agree with this (6&7) and Geddes found on figures based on 300 cases.

In multiparae 10.5% of the total vertex cases were occipito-posterior.

In primiparae 20.8% of the total vertex cases were occipito-posterior.

He ~~this~~ suggests that this frequency in primiparae is due to the condition of the abdominal wall, the greater muscular power, the muscles not having been weakened by previous distention, and points out, with the aid of the accompanying diagram, that the tense abdominal wall tends to push the top end of the level (the lever being the uterine axis "A" "B") backwards, and thus the lower end of the lever "B" by acting more on the anterior part of the head , fixes the head in this abdominal position because flexion is retarded. In multiparae, on the other hand, the abdominal wall being more relaxed, the top end of the lever "C" being forwards, produces pure flexion and thus rotates the occiput forwards.



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Especially in elderly primiparae are posterior positions of frequent occurence. This may be partly due to primary uterine inertia which in these late first pregnancies is a common complication of labour.

E T I O L O G Y.

Posterior positions are to be found in almost all varieties of pelvis and with all sizes of children and foetal heads. Possibly, however, there is one exception to this - the small round pelvis- which should favour flexion and, following the rule produce anterior rotation. Whereas in a flat pelvis, the oblique diameter being the roomier and the pubic arch being broader, the sinciput will descend more readily thus favouring extension and posterior rotation of the occiput.

Let us make a study of the

I. Pelvis.

II. Foetus.

(a) In cases in which the occiput rotates from a posterior to an anterior position.

(b) In cases in which the occiput is born posterior when anterior rotation has failed to take place.

I (a). Pelvis.

I have calculated the average pelvic measurement of 500 consecutive cases of class I (a), (i.e. cases which rotated) and found the average to be,

Inter-spinous.	Inter-cristal.	Conjugate ext.
10	10¾	7½.

I (b). 100 consecutive cases of I.(b) (i.e. cases born with occiput posterior) I found the average to be,

Inter-spinous.	Inter-cristal.	Conjugate ext.
10	11	7½.

Thus the only difference was a quarter of an inch in the inter-cristal diameter.

Pelvic deformity.

The pelvis was noted as being deformed in 5.0% of the total number of posterior positions. The actual figures being:-

Out of 3,346 cases deformed pelvis was noted in 167.

In the majority of these cases the pelvic deformity was that of flattening.

Bates (8) has published one case with a history of trauma producing a pelvic deformity which was the causation of an occipito-posterior position. In this case an injury had caused the right ilium, at its junction with the sacrum, to lie posterior to its normal plane.

II. Foetal.

We shall consider,

1. Foetal head.
2. Foetal weight.
E. Foetal length.

In class I (a) (i.e. cases which rotated). The average of 500 was:-

Circum-ference.	Bi-parietal.	Bi-temporal.
$13\frac{3}{5}$	$3\frac{1}{2}$.	3
Occipito-mental	**Occipito-frontal.**	**Suboccipito-frontal.**
(not noted)	(not noted)	$4\frac{1}{4}$.

In class I (b) (i.e. cases born with the occiput posterior) the average of 100 was :-

Circum-ference.	Bi-parietal.	Bi-temporal.
$13\frac{1}{3}$	$3\frac{1}{2}$	3.
Occipito-mental.	**Occipito-frontal.**	**Suboccipito-frontal.**
5	$4\frac{1}{3}$	4.

The average size of the foetal head in children born with the occiput posterior is thus below the normal. von Weiss (9) found this so in about 40%. The measurements were taken about two hours after the birth of the child.

Foetal weight.

A small child has been suggested by many as a cause of posterior positions of the occiput, but this was not found to be the case.

I took the weights of 400 infants, and have divided them thus:-

I. 200 which were occipito-posterior positions.

II. 200 which were normal anterior positions.

I & II were then subdivided into:-

(a) 100 infants of multiparous women.

(b) 100 infants of primiparous women

so that the proportions should be exact.

The average weight of an infant in

I (i.e. occipito-posterior positions) was 6 lbs.14ozs, plus a small fraction.

II.(i.e. normal cases) was 6 lbs.14 ozs. plus a small fraction.

Foetal length.

In the same way I calculated the foetal length.

Taking 400 infants and dividing them as above into

I. 200 occipito-posterior positions,

II. 200 normal anterior positions.

I & II were then subdivided into:

(a) 100 infants of multiparous women.

(b) 100 infants of primiparous women.

Thus I found the average length of an infants in

I. (i.e. occipito-posterior positions) was 20 $\frac{5}{8}$ inches.

II.(i.e. normal anterior positions) was exactly the same 20 $\frac{5}{8}$ in.

THE QUESTION OF ROTATION.

To what can we attribute this failure of anterior rotation ?. Is it due to nothing else than incomplete flexion? This is at the root of the whole trouble.

The cause of this deficiency of flexion may be due to,

1. Diminished uterine forces.

2. Pelvis relatively large to foetal head.
3. Foetal head relatively small to pelvis.
4. Pelvic deformities (except small round pelvis)
5. The axis of the uterus and of the pelvic brim being concave behind.
6. The greatest diameter of the head being behind the centre.

The last two causes are the most important. I quote from Herman (10) who explains as follows:- "The child must accommodate its attitude to the space in which it lies. Because the axis of the upper part of the utero-pelvic canal is concave behind, when the back is in front the spine will be bent so that the child's abdominal surface which is behind may be concave. If the child lies with its abdomen in front then accommodation to the cavity in which it lies can only be got by some extension of the spine. If the extension of the spine is enough to bring the occipito-spinal joint in front of the line in which the propelling force acts, then this force will, unless opposed, produce full extension of the head."

"If you take the foetal skull and hold it in the pelvic brim in the first position you will see that the largest transverse diameter of the head, viz. the bi-parietal, lies exactly in the oblique diameter of the brim, where there is plenty of room for it. Now turn it round and hold it with the occiput behind instead of in front and you will see that the bi-parietal, instead of being in the oblique diameter of the brim, is in a part of the

pelvis where there is less room for it"

"Hence when the occiput is behind it does not come down so easily as when it is in front and its descent is likely to be hindered if the child be very large or the pelvis smaller than usual"

In the majority of cases there is sufficient flexion to cause the occiput to reach the pelvic floor before the sinciput. There it rotates through three-eighths of a circle (termed "long rotation") and comes finally to lie under the pubic arch - an occipito-anterior position. The recurrence of occipito-posterior ~~presentations~~ positions in succeeding labours has been noted by several authors (11 & 12). In one, a woman of 26, the position of the child in the first, second and fourth labours was posterior and in two cases it was necessary to remove the placenta manually. THE LENGTH OF LABOUR as compared with a normal labour in which the occiput is primarily anterior is prolonged.

For the sake of comparison I took the average time for the completion of a normal labour in which the occiput was primarily anterior.

By a normal labour I mean a labour in which no interference has been necessary for its accomplishment and in which the second stage has not lasted more than two hours.

In these cases the average was found to be,

In 250 primiparae.

First stage 14 hours 40 minutes.

Second stage 1 hour 15 minutes.

Third stage 14 minutes.

In 250 multiparae.

First stage 7 hours 45 minutes.

Second stage 15 minutes.

Third stage 13 minutes.

In cases ~~The labours~~ in which the occiput was primarily diagnosed as posterior the lengthening of all stages of labour was ~~is~~ very striking.

In 250 primiparae.

First stage 18 hours.

Second stage 1 hour 20 minutes.

Third stage 16 minutes.

In 250 multiparae.

First stage 9 hours 27 minutes.

Second stage 26 minutes.

Third stage 14 minutes.

Hence the time of labour is lengthened on an average in primiparae,

In the first stage by 3 hours 20 minutes.

Second stage by 5 minutes.

Third stage by 2 minutes.

or a total for all stages of 3 hours 27 minutes.

In Multiparae it is lengthened on an average,

In the first stage by 1 hour 42 minutes.

Second stage by 11 minutes.

Third stage by 1 minute.

or a total for all stages of 1 hour 54 minutes.

This prolongation of labour is even more marked in cases in which the occiput is born without interference in the posterior position; the average of 99 cases being,

I. In primiparae.

First stage 23 hours 53 minutes.

Second stage 1 hour 22 minutes.

Third stage 15 minutes.

II. In multiparae.

First stage 10 hours 43 minutes.

Second stage 50 minutes.

Third stage 15 minutes.

Hence the time of labour is lengthened over the normal on an average, in primiparae, of

First stage 9 hours 13 minutes.

Second stage 7 minutes.

Third stage 1 minute.

or a total in all stages of 9 hours 21 minutes.

The time of labour is lengthened over the normal on an average, in multoparae, of

First stage 2 hours 58 minutes.
Second stage 35 minutes.
Third stage 2 minutes.

or a total in all stages of 3 hours 35 minutes.

Why is labour protracted in occipito-posterior positions?

1. Owing to the malposition of the head we have an elongated bag of membranes failing to exert their normal dilating effect on the cervix. This may also result from premature rupture of the membranes and this nas been noted by several authors.

I found it to occur in 28% of multiparae alone. Assuming the premature rupture of membranes in multiparae to mean cases in which the membranes have ruptured more than two hours previous to delivery. I did not take statistics of this premature rupture in primiparae because the limit of time has not been definitely stated by standard authors, but I believe it occurs as frequently, if not more so - of course allowing a much longer period to elapse between the rupturing of the membranes and the delivery of the child.

II. Owing to the incomplete flexion of the head the occiput will not dilate the cervix in the same manner as when flexion is more complete.

III. The head meets with greater resistance in its descent as the bi-parietal diameter is passing between the sacral promontory and the ilio-pectineal eminence where there is scarsely room for descent.

IV. There is often delay in the rotation of the head. This may be due to several reasons, but as a rule it is due to incomplete flexion of the head. It is sometimes noticeable that if we produce flexion manually the head will rotate in a few seconds.

Thus it is not actual rotation that prolongs the labour but primarily inefficient flexion of the head.

V. Again, we must allow for time for the moulding of the head, especially in occipito-posterior positions, where the head is born posteriorly. The compression of the suboccipito- bregmatic plane is exaggerated and the parietal bones over-lap the frontal bones to a greater extent.

D I A G N O S I S.

The great importance of diagnosing a posterior position cannot be over-estimated. I have endeavoured to point out the frequency with which they are met. This is not yet fully appreciated by the medical profession. The system which many practitioners have of omitting to diagnose position until some complication arises is to be thoroughly condemned. One of the reasons why posterior positions have not had their due consideration is that the diagnosis is made in the second stage of labour when the occiput may have had time to rotate to the anterior position.

One fully appreciates that a correct diagnosis is often difficult to make, since with a woman in labour the abdomen may be rigid and the pains frequent. Per vaginam, the head may be high up, the fontanelles difficult to determine or the cervix only partially dilated. In such cases, a vertex presenting when the labour is prolonged, the pains frequent and of a stabbing nature, when the cervix is not dilating, the membranes either prematurely ruptured or elongated, always consider the possibility of an

occipito-posterior position.

Sometimes the pains are diagnosed as false labour pains since there may be no associated dilatation of the os.

Premature rupture of membranes I have already pointed out occurs in 28% of cases, the reason being that the head in the posterior position does not fill the pelvic cavity so accurately as in anterior positions. Hence, intra-uterine pressure causes early rupture. It has been suggested that a continual leakage of liquor amnii is a suggestive sign that the head is not acting as an efficient plug. (13).

The diagnosis of posterior positions in vertex presentations we shall consider under two headings.

1. During pregnancy, or early in labour, before the dilatation of the os.
2. During labour, the os being sufficiantly dilated.

1. During pregnancy we are usually able to diagnose the posterior position by abdominal palpation. The limbs or small parts are to the front instead of the smooth contour of the back which we find in anterior positions. We are, however, able to distinguish the back on either side, if not we will find the edge of the back or the anterior shoulder when the back is more posteriorly situated.

On pressing deeply in with the tips of the fingers in the iliac fossa we are able to distinguish the side to which the occiput is directed by our fingers sinking deeper in, in other words, meeting with less resistance. Due to the extension of the

foetal head the fingers of the palpating hand may be able to depress the abdominal wall between the foetal spine and chest. This has been termed Pawlik's sign.

Some difficulty will be found in diagnosis by abdominal palpation if the uterus is tense or irritable. In the latter case contraction at the slightest attempt at palpation taking place. We may thus find auscultation of some little help. The foetal heart being usually heard at a higher level and more external to the middle line than in the first and second positions. A practical point of great value is that we can estimate by palpation the amount of flexion from the ease with which the frontal eminence can be felt.

2. During labour, if the os is sufficiently dilated, as well as taking advantage of the interval between the pains for abdominal palpation, we will examine per vaginam. The examining finger will then endeavour to determine the situation of the fontanelles and the guide to this will be the sagittal suture lying in the plane of one of the oblique diameters of the pelvis.

In the majority of cases the anterior fontanelle is easily recognised in a position near the pubis to one side of the middle line, the ease with which it is felt is due to the incomplete flexion of the head. If we are still uncertain as to position, the cervix being sufficiently dilated, palpation of the anterior ear confirms the diagnosis. By this method we must be careful not to go by the direction in which the helix is pointing, as in course of rotation the helix may be folded back upon itself and

thus mislead us. It is the direction of the tragus we look for. Although this manoeuvre necessitates the introduction of the hand into the uterus, still, with a careful operator the risks are small in comparison with the benefit derived from a certain diagnosis.

Other points such as, (a) Parchment os; (b) Sensation of emptiness in the hollow of the sacrum, are sometimes noticeable. The former has been described (13) as being due to the head pressing on the posterior lip more than on the anterior lip, the cervix thinningthen, especially posteriorly. The anterior lip is pendulous and the cervix as a whole may seem to hang free in the pelvis. The latter has been described as being due to the arrest of the head at, or near, the promontory of the sacrum.

Finally, in cases in which we have applied forceps we ought to make very certain that we are not dealing with a posterior position when the amount of force necessary to pull down the head is excessive or if the forceps, having been properly applied, keep slipping off. If there is a definite gaping of the vaginal outlet posteriorly without the head coming down, then certainly suspect an occipito-posterior position (21).

Mention at this point might be made of the frequent occurrence of the production of a caput succedaneum. This is usually larger than that found in anterior positions. It is found on the anterior superior angle of the parietal bone sometimes over-lapping the frontal suture. In the right posterior position it is found on the left parietal and in the left posterior position it is found on the right parietal.

This is thus often a means of diagnosing position in cases born before arrival.

T R E A T M E N T.

The majority of cases do not require treatment as rotation takes place normally and without difficulty; this I found in 71% of cases; but those which require treatment we shall discuss under two headings.

1. Non-operative.
2. Operative

1. Non-operative. The condition may occasionally be remedied in the later months of pregnancy, or during the first stage of labour, by position. The genu-pectoral position is the one usually suggested in text-books, but I agree with Cliffon Edgar (5) that a woman will not remain in this position for long owing to the intense discomfort. He has suggested the following method:- The woman is placed in an exaggerated lateral prone position with a pillow under the lower buttock, the side on which she is placed being the side to which the occiput is directed.

Some authorities suggest external abdominal manipulation so as to change the position for a posterior to an anterior. This method is seldom of any use unless the occiput be almost in the transverse, when we may, the membranes being intact, be able to bring the edge of the trunk over so that the back lies anterior and to rotate the occiput forwards.

A simple remedy I have often found successful in treating

posterior positions in the first stage of labour is by giving an enema. That done, we can leave the case for a time and come back and find that after action of the bowels the head has rotated.

If the cause be due to uterine inertia, give a sedative and after rest the increased vigour of the pains will encourage flexion and descent, hence, anterior rotation.

2. Operative. We can employ operative measures which only a few years ago would have been deemed positively dangerous because, in recent years, our knowledge of antisepsis and asepsis, along with our increased skill in technique, allows us to do so.

Can we in some way have an idea as to the likelihood of rotation?

Sloan (14) has answered this in the following way:- "The degree of flexion and the degree of descent combined with the quality of the pains and the rate of progress will be the means by which we may determine the diagnosis"

When are we going to interfere?

This is a question to which a definite answer is difficult. To a great extent each case must be decided on its own merits, we cannot lay down hard and fast rules.

I. It will depend on the constitutional state of the mother.
II. On the foetal vitality.
III. To some extent on our own sympathetic personality or otherwise, since some practitioners advocate that every woman's travail should be curtailed when possible by chloroform and

forceps. In Queen Charlotte's Hospital, if the labour is delayed in the second stage over two hours, some method of manual interference is proceeded with.

1. To encourage flexion we will press up against the sinciput with the first and second fingers during the pains. This sometimes succeeds, if the pains are good, in completing flexion and hence rotation, or we may pull down the occiput with the fingers, *or vectis*. This method is now out of date and is difficult and less likely to succeed. We may, however, combine the two methods with some measure of success, but the adaptation of the foetus to the maternal spine renders full flexion impossible.

Manual rotation. In some cases this alone is enough to terminate the labour. I found this so in about 1% in the first 2,000 occipito-posterior positions studied; after that the practise of putting on the forceps immediately after rotation, became general. It has been employed in high cases and medium cases, but it is not usually performed until the head is low down.

Methods suggested have been various. An American writer (15) advocates rotating the mother into the genu-pectoral position round the foetus, but suggests an awkward moment when the patient's knee passes over the accoucheur. However, we will only consider the methods most likely to prove applicable and successful.

Smellie recommended the introduction of two fingers into the vagina to be pressed against the side of the head during the pains, thus favouring rotation. The most satisfactory method and the one generally applied in Queen Charlotte's

Hospital, is the introduction of the whole hand into the vagina. The vertex is seized between the fingers and the thumb, in such a manner that the fingers are well spread round the head. The head is then flexed, after which rotation of the head is accomplished. At the same time, however, the anterior shoulder is brought forward by the external hand. This is almost essential as then we have the rotation of the trunk with the head, thus there is not the probability of the occiput slipping back into its old position. This I found successful in 322 out of 3,764 cases, or 8.5%. It is curious to note in considering some of the continental literature, the small attention that is paid to this manoeuvre. I believe that they do not pay enough attention to pushing the head well up and producing flexion, neither do they bring forward the anterior shoulder as the disfavour with which the method is met seems to be due to the fact that they do not get rotation to occur. If rotation fails to take place by this method, there is still another we may attempt. By introducing the hand into the uterus beyond the head and pushing round the anterior shoulder, rotation has been successfully accomplished in many cases, although there may difficulty in passing the hand up past the head. Lackie (16) in a paper discussing the difficulty in applying forceps in occipito-posterior cases, and the amount of force necessary to pull down the head, quotes three cases, in which after many attempts at forceps, delivery succeeded almost at once after manual rotation.

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Fig II

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Miami Medical College, suggested a good method which deserves our attention, as follows:-

"With the occiput lying against the right side of the pelvis there is plenty of room for the occiput to move to the posterior end of the left oblique diameter, the new position it must assume in rotation. Assuming that the cervix is fully dilated, the left hand is carried into the vagina, the entire hand is inserted if the head is high, the half-hand if the head is low. The palmar surface of the fingers is applied to the right side of the occiput, assuming the case to be a right occipito-posterior position. In order to do this, sharp outward rotation of the hand and forearm is necessary and this rotation should precede the introduction of the hand. The ulnar edge of the hand is towards the pubes and the thumb points downwards and to the patient's right" (Figure 1).

"Several advantages are secured by this manoeuvre. It is easily accomplished without disturbing the position of the head as there is always plenty of room in the left side of the pelvis, there is no danger of pushing the head up nor of diminishing flexion. Another advantage is that by this preliminary twisting of the hand and forearm, a great increase of power is gained. As rotation takes place the muscles are untwisting and the available power is several times greater than if the opposite process were taking place. Co-incidentally with the placing of the left hand, the tips of the fingers of the right hand are pressed firmly on the abdominal wall above the pubes until they

Fig 1

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come into contact with the left frontal region of the child's head. The position is readily recognised by the combined manipulation. When the external hand is correctly placed the head is held firmly in the grasp of the two hands" (Fig.2).

"The head is rotated by the combined action of the two hands. At the beginning of rotation the fingers of the external hand make pressure against the right side of the pelvis. In cases where considerable force is needed the fingers necessarily tend to become flexed and therefore transmit most of the pressure from the tips."

"In the left occipito-posterior positions the method of rotation is the same but the right hand is used internally and the left externally enabling the operator to make a direct pull on the occiput. The mechanism by which flexion is produced is incidental to the method of rotation. With the head held between the hands the attempt is made to rotate. If the rotation requires slight force very little change in flexion occurs. If considerable force is necessary, the pressure of the external hand crowds the occiput downwards. The amount of flexion is therefore almost automatically regulated to meet the requirements of the particular case. Simultaneously with the pressure of the internal hand the external hand makes pressure downwards in the fronto-temporal region of the head. With the backward movement of the sinciput the pressure is directed more to the mother's left in order to be about at right angles to the side of the head. It is evident that with the internal hand capable of considerable force

and with the external hand utilizing an effective leverage, a tremendous rotating power could be applied if necessary. There can be no question that the method is well adapted for unlocking an impaction."

This writer makes no suggestion as to the methods of applying forceps but suggests that the rotating hand be removed before forceps are applied. This removal of the hand is not necessary. It is well to apply the right blade of the forceps in R.O.P. positions and the left blade in L.O.P. positions. After rotation by the above method, the blade can be introduced without risk of the head returning to its original position and when so introduced it may be held by an assistant. This takes the place of the restraining hand on the occiput.

Forceps. Forceps are used more frequently on the continent and especially in France. In the statistics here collected, out of 3,764 posterior positions, forceps traction and rotation was practised in 22 cases successfully, or in about 0.6% of cases. This method, in the hands of others than experts, is difficult and dangerous especially in high cases; it is much more applicable in low cases.

In high cases. I have translated from the recently published French work of Jeannin et Guénot.(18).

Application of the blades. The blades of the forceps are introduced into the uterus so that the handles lock almost in the vagina. Endeavour to obtain a doubly oblique application of the forceps.

Oblique as to the mother.

Oblique as to the foetus.

Oblique as to the mother; the posterior blade being placed in front of one of the sacro-iliac symphyses and not directly in front of the promontory where it would be difficult to introduce; the anterior blade being placed at the level of the ilio-pectineal region of the opposite side and not directly behind the symphysis. Oblique as to foetus; one of the blades resting on one of the mastoid regions and the other on the frontal eminence of the opposite side. There is some advantage in directing the pelvic curvature of the forceps in such a way that its cancavity be turned to the side of the face of the foetus. The axes of the blades thus get nearer to the occipito-mental axis and in this way the instrument is less likely to get loose. It is consequently toward the right that this pelvic curvature must look when the head is in the left posterior, and toward the left in the right posterior.

1. Thus, in a left oblique we introduce the right blade on the right backwards on to the frontal eminence which faces the sacro-iliac symphysis.
2. We introduce the left blade in a forward direction on to the mastoid region which faces the left ilio-pectineal eminence.
3. Articulation, the handles being held very low depressing the perineum firmly.
4. Traction, helped by external manual pressure from above, the

traction being directed in a forward and backward direction, it is best that the operator be sitting on the floor.

5. The head having been brought down to the perineal floor, rotation is proceeded with as follows:-. The left hand gets hold of the tractor and keeps it in position in the prolongation of the axis of the vulva, in order that whilst turning, the head should not go back into the cavity. The right hand takes hold of the handles and brings them directly upwards towards the pubes. This done, the hand is going to bring those handles from right to left and downwards, causing them to describe a movement of circumduction as wide as possible. They draw thus, in space, a cone of revolution round the tractor. To this wide movement of the handles corresponds a movement of the blades which cannot wound the vagina, but it must have a range of 180 degrees, and when complete, the handles hang directly down in front of the perineum. It must have been done very slowly, in several stages the head just passing from the occipito-sacral (= persistent occipito-posterior position) or right posterior into the transverse, thence into the right anterior and occipito-pubic. If the position was a left posterior, it is from left to right we rotate. The right hand would then keep the tractor in position whilst the left would travel with the forceps. Tarnier's forceps are used as a rule, but if high rotation is attempted forceps with a perineal curve which allows a more correct hold and a stronger grip, are preferred; It is well that the ordinary traction rods be replaced by tapes passed through the holes in the blades. This

kind of arrangement is possible in any kind of forceps and allows us to correct the inclination of the posterior parietal bone. To do this we have simply at the beginning and during the tractions, to make the maximum force bear on the anterior tape. One draws down thus the corresponding parietal.

In medium cases the above method may also be used and we should first encourage flexion of the head by manual manipulation.

In low cases we have the two alternatives. Either extract (1) Directly, as a posterior position, or (2) Artificially rotate the head to an anterior position. Which shall we do?.

Should the head be partly through the vulva and consequently partly out of the cavity, it is simpler to extract it in posterior position, thus:-

(1) Exert traction almost in a horizontal direction until the forehead appears at the vulva,

(2) The root of the nose being pressed under the symphysis, one then brings up the handles a little more to the horizontal, disengaging successively at the level of the bregma, the sagittal suture, the posterior fontanelle and finally the occiput.

(3) Lastly one brings the forceps down, which causes the disengagement under the symphysis of the face. All this must be done very slowly, the perineum being in greater danger of laceration than in occipito-pubic cases. Now only grip the handles with the left hand and bring them up, whilst the right hand directs the disengagement of the bregma, frontal eminence and face.

Of the 3,764 posterior positions, 122 were cases in which the occiput was born posteriorly, that is 3.2%. Of these, 23, or 0.6% required forceps and 99, or 2.6% were born naturally.

Paul Barr (19) says that before applying forceps we should try to rotate manually, but that seldom succeeds, therefore you apply forceps and rotate, as described above. If it is in the oblique and you cannot rotate, then convert into an occipito-sacral and deliver as such. Do not force rotation by forceps. Increase pressure on the frontal region by bringing up the handles towards the right thigh in left posterior cases, and to the left thigh in right posterior cases.

Sometimes there may be difficulty in diagnosing the posterior position. In which direction are we going to rotate?. Tarnier and Pudin (20) then suggest that we rotate the head in the direction in which it moves best. We must not forget, in using forceps as a means of rotation, the possibility of the blades cutting into the foetal head with the one side, involving the facial nerve and causing facial palsy, and with the other side possibly lacerating the vagina.

With cases in which we suspect a bad tear of the perineum, lateral episeiotomy is to be recommended.

Version. was performed in 0.3%of cases. This method is not to be recommended as the foetal mortality is higher than with other

methods. However, it may be preferable to other methods in some cases. Clifton Edgar also takes this view and suggests it as a last resort to be followed if unsuccessful by craniotomy or symphysiotomy. However, in posterior parietal presentations version might have some advantage over forceps.

Craniotomy was performed in 15 cases, or 0.4% and symphysiotomy was not in any case attempted.

Caesarean section was performed in 20 cases, or 0.5%.

P R O G N O S I S.

I. Maternal.

II. Foetal.

1. Among the dangers to the mother are, (a) Prolonged labour, (b) Vaginal laceration, (c) Perineal laceration, (d) Complications arising out of operative interference.

(a) Prolonged labour may cause great fatigue and exhaustion in some cases leading to the death of the patient. I have already demonstrated the extent of the lengthening of labour, both in multiparae and primiparae.

(b) A vaginal laceration in this malposition was first pointed out by Sir Halliday Croom who described a deep seated lesion of the vagina at the level of the ischial spine. As it might be the causation of sepsis, this should always be looked for.

(c) Perineal lacerations are very common. Where the occiput was born posterior they were not so common. Out of 122 such cases, slightly over 20% showed perineal lacerations. They were equally divided between primiparae and multiparae. This fact may be due to the extra care taken and the smaller size of the head.

(d). Excessive operative interference may result in severe lacerations, shock, and sepsis. The maternal mortality in all cases was 0.3%.

II. Among the dangers to the foetus are,

(a) Foetal distress due to long labour.

(b) Cerebral compression due to severe moulding.

(c) Injuries due to forceps and operative interference

(d) Asphyxia, due to the malposition, the cord becoming prolapsed. This happened in 31 cases in all (3,764) or 0.8%.

The frequency with which the child is born in a callapsed condition calls for us to have the means always ready for the resuscitation of the child.

In all cases, primarily diagnosed as occipito-posterior positions, the foetal mortality was 5.1%.

Prematurity was 8.0%.

In cases in which the occiput was born posterior, rotation having failed to occur, the foetal mortality was 7.9%

Prematurity was 13.0%.

Intercurrent complications were found as follows, out of 3,764 posterior positions:-

Placenta praevia 19, or 0.5%.

Post-partum haemorrhage (when more than 20 ounces were lost) 138, or 3.5%.

Premature rupture of membranes.

(Multiparae only in whom the membranes ruptured more than two hours previous to delivery)
396, or 27.9% of the total number of multiparae.

Laceration of the perineum occurred in 1,045 cases, or 27.7%.

Out of 3,264 positions.

Ante-partum haemorrhage, 32, or 1%

Prolapse of cord ..... 31, or 0.9%.

Deformed pelvis .....163, or 5.0%.

Adherent placenta ..... 52, or 1.6%.

Hydramnios ..... 12, or 0.4%.

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